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15 March 1950

TO : Executive, [illegible]

THRU : Assistant Director for Special Operations

FROM : Chief, Communications Division

SUBJECT : Research and Development Project OPC-29-50

GENERAL:

In the field of communications, and particularly in the field of [redacted] communications, rather noteworthy strides in equipment development have been made. Perhaps the most significant progress has been in the field of miniaturization. The state of the art has now advanced to where miniature vacuum tubes, miniature component parts and assembly techniques can solve the problem of miniature radio equipment in a most satisfactory manner. STAT

There has been, however, no adequate solutions offered for the reduction of size and weight of primary sources of power. The [redacted] equipment used throughout the world by this Agency varies in its primary power requirements, with some units requiring up to about 85 watts of power. The presently available methods of obtaining such power are: STAT

1. Commercial electric power
2. Storage batteries
3. Gasoline powered generators
4. Manually powered generators.

The first of these is often unavailable and when available may be erratic and generally unreliable.

Storage batteries are basically very heavy, bulky, have poor low temperature characteristics and must be recharged from an independent source of primary power (one of the other three).

Gasoline or more properly termed internal combustion engine power generators have the best possibility of success since the efficiency is higher per watt per pound than any other system. The lightest weight dependable generator available today, however, is about 25 lbs. This unit delivers about 400 watts and is, of course, larger than required to support [redacted] radio stations. STAT

Hand generators are a practical means of supplying power to a radio set in the class of our equipment and are supplied at the present time. Their disadvantage lies in the fact that two persons are required to operate a station; one to operate the radio set and the other to crank the generator. In many cases for operational reasons this may be inconvenient or even impossible.

Since some auxiliary source of power must frequently be taken into the field because of a lack of commercial electrical power, it is axiomatic that the problem of miniaturizing a primary power source is of top importance.

1. About two years ago, a commercial company [redacted] 25X1
[redacted] became interested in the miniaturization of internal 25X1
combustion generators. This interest came about thru their association with the Government Air-Gun Rescue Communications development program. This particular program led to the study of such types of primary sources of power. The general specifications for an Air-Gun Rescue power unit are ideally suited for the powering of this Agency's long range miniature radio equipment. At that time, the Communications Division was informed of the study being made. It was not until the late summer of 1949 that this Corporation felt that their program had advanced sufficiently to consider the development of a unit suitable for our particular requirements. At that time, OPC became interested in such a device and submitted a project to allow the [redacted] to undertake the development of a miniature 25X1
power generator. A rough requirement was set up and the Corporation made a study lasting over a period of about four months. The Corporation then made a proposal complete with specifications to develop for the Agency two experimental generators which would meet the general requirements.

2. This proposal appeared satisfactory to the Communications Division and was submitted to the Procurement and Supply Division. It was agreed, however, that we should first exhaust government sources of supply before granting a contract to an outside commercial firm. Accordingly, the Army Signal Corps was consulted for their views as to what was available and to their opinions as to the practicability of such a development program. The Communications Division had an engineer accompany a representative of PSD to the Signal Corps laboratories at Fort Monmouth, N.J. Unfortunately, little conclusive information as to the feasibility of the contemplated development was obtained. The general attitude seemed to be that "while it looks difficult, we will not say that it cannot be done". A copy of a report written by [redacted] Chief of the Power Branch, who had 25X1
witnessed a demonstration of an earlier [redacted] model of the engine 25X1

for a miniature generator, was obtained. This report contains considerable technical detail and seems generally optimistic about the chances for success of such a device.

In the course of the visit to the Signal Corps laboratories, it was disclosed that the Signal Corps had been working on a small generator of their own. Actually, their project is a modification of a generator designed during the war for OSS. This generator would be ideally suited for many applications by this Agency. The Signal Corps generator is somewhat larger than the unit proposed by [redacted] and is larger than desirable for many types of operation. This Signal Corps generator should, however, be capable of longer running life due to the larger size. Long life is not a primary consideration for normal [redacted] work since the actual running time would be very small. 25X1 STAT

3. Prior to the trip to the Signal Corps laboratories, an analysis of the problems concerning such a development was made by engineers of the Communications Division. Their findings concur generally with the [redacted] proposal. It should be pointed out that a difference exists between a procurement of finished equipment and Research and Development to attempt to devise a piece of equipment for which a requirement exists. 25X1

RECOMMENDATIONS:

In view of the operational requirement, it is recommended that no avenue of approach having a possibility of success should be left unexplored. Therefore, it is suggested that:

1. The [redacted] be permitted to carry out a program to develop a power generator to meet our requirements, as originally planned. 25X1

2. The Army Signal Corps be allotted sufficient funds and a priority be established to permit them to continue their project. This project is of considerable interest to the Agency but cannot continue without our support.

3. The problem of supplying a miniature source of power be given top Research and Development priority and that neither recommendations under 1. and 2. be considered the ultimate solution to the problem.

/s/
[redacted] 25X1
Chief, Communications Division

cc: PSD/SSS
OPC

sent to ADSO
15 Mar 50